Experiential Avoidance and Attention to Emotional Stimuli

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Abstract

Experiential avoidance (EA) is a maladaptive coping strategy that involves avoiding unwanted internal experiences (i.e., thoughts, emotions, and physiological sensations). Although a high level of EA is associated with increased psychological distress and several forms of psychopathology, there is a lack of research on cognitive factors involved in EA. To examine whether individuals high in EA may be more sensitive to noticing negative emotional stimuli, participants with either high (n = 22) or low (n = 21) levels of EA engaged in an Emotional Stroop Task containing negative emotional, positive emotional, and neutral words. Negative and positive emotional words were similar in arousal levels. The low EA group had significantly delayed response times for negative compared to positive emotional words. In contrast, the high EA group exhibited longer response times for both negative and positive emotional words, compared to neutral words. The high EA group also had significantly greater response times on positive words compared to the low EA group. These results suggest that individuals high in EA may demonstrate a bias toward attending to emotionally arousal stimuli in general, not just to negative stimuli.

Keywords

Experiential Avoidance; Attention Bias; Stroop Task

1. INTRODUCTION

1.1. Experiential Avoidance

Experiential avoidance (EA), the tendency to avoid unwanted internal experiences, is a construct that has gained increasing attention in the field of clinical psychology in recent years [1]. This phenomenon occurs when an individual is unwilling to remain in contact with particular private experiences, such as thoughts, emotions, and physiological sensations, and takes steps to alter the form or frequency of these experiences and the contexts in which they occur [2]. Thus, individuals high in EA avoid distressing stimuli and engage in behaviors to escape or alter negative internal events, as a strategy of coping with these unwanted experiences. EA is maladaptive because suppression of thoughts and emotions paradoxically produces increases in these internal experiences over the long-term [2] and exacerbates psychological symptoms of distress [1]. For example, in the famous 'White Bear' experiment [3], participants who were asked not to think of a white bear reported more thoughts about a white bear than participants who were told about a white bear, but not asked to suppress thoughts about it. This task highlights the paradoxical effects of attempts to avoid, control, or suppress internal experiences. When individuals attempt to reduce unwanted internal events, the result is long-term increases in those events, creating a self-amplifying loop that is resistant to change [4].

Avoidance of internal sensations (i.e., thoughts, emotions, physiological sensations) is thought to play a large role in the development and maintenance of several forms of psychopathology. For example, individuals with panic disorder suffer from unwanted physiological sensations. Paradoxically, focus on and attempts to decrease physiological anxiety symptoms lead to increases in the symptoms and distress. EA has been implicated in a number of psychological disorders, including substance abuse, anxiety disorders, depression, eating disorders, and borderline personality disorder, as well as health concerns including obesity and inability to quit smoking [2].

Chronic suppression and avoidance of thoughts is related to an increased sensitivity to, or noticing of, distressing stimuli, which translates into the magnification of negative mood states [5]. However, this line of research has focused on thought suppression rather than avoidance of internal events more broadly. Consistent with research on thought suppression, it is expected that individuals high in EA pay more attention to distressing stimuli, which they try to suppress, leading to an increase in negative affect.

Several recent studies have begun to examine this relationship in terms of underlying cognitive factors. Based on the pattern observed in experiential avoidance, it is expected that individuals high in EA will have a bias to disproportionately attend to distressing stimuli compared to non-distressing stimuli, which they will then attempt to suppress. This represents a potential cognitive vulnerability among individuals high in EA that increases the risk of psychopathology [6]. One study demonstrated this using an emotional narrative story paradigm containing negative emotional, positive emotional, and neutral ("filler") stories [6]. The narratives implied emotions (i.e., negative, positive) that were either matched or mismatched to valence of the emotion directly stated in the first sentence of the story. Results indicated that participants with higher experiential avoidance scores displayed increased reading times for mismatched negative emotion stories, but not positive emotion stories, indicating a bias in the cognitive processing of negative emotions. This result suggests increased cognitive resources toward processing of negative events, with more limited processing of positive emotional events [6]. The results also point to underlying factors that may be involved in EA; in particular, individuals high in this construct may be more sensitive to negative emotional material compared to individuals low in EA.

Another recent study explored the effects of EA on performance on a working memory task [7]. Participants in this study viewed a film with either neutral or negative emotional content and then were asked to engage in a high cognitive demand memory task involving memorizing figure sequences. Results indicated that there were no differences in performance on the working memory task between individuals low and high in EA after watching the neutral film; however, high EA participants had significantly worse performance on the task after watching the negative emotional film compared to those low in EA [7]. This study provides evidence that, in the context of negative emotion, individuals high in EA demonstrate impaired cognitive processing, likely due to interference from the presentation of negative emotional content.

Based on the results of these studies, we can conclude that individuals high in EA may have increased processing of negative emotional material compared to positive or neutral stimuli, and demonstrate impaired performance on high-demand cognitive tasks in the context of negative mood, compared to individuals low in EA. However, more research is needed to clarify the mechanisms by which individuals high in EA attend to emotional stimuli in order to understand cognitive factors involved in EA. For example, it is unclear whether it is the valence of the words (i.e., positive or negative) or the arousal that is elicited by the word that accounts for this relationship. In this study, the arousal level of the stimuli was similar for both positive and negative emotional content.

Selective Attention Bias

Selective attention bias refers to selective information processing resulting in the awareness of a specific feature in their environment [8]. Emotional arousal can shift attention to a stimulus and disrupt the efficiency of information processing [9]. Models of selective attention bias suggest that there are individual differences in the degree to which one attends to danger-laden stimuli [10]. Selective attention bias has been observed in several psychological disorders, including anxiety disorders, where individuals with high trait anxiety demonstrate an attention bias toward threatening information [11], and depression, where depressed individuals show attention bias to negative stimuli [12].

Research has yet to be conducted on selective attention bias in EA. Based on theories suggesting that increased 'noticing' of negative emotional information is an element in the cycle of experiential avoidance, as well as the literature demonstrating cognitive effects of EA, it is proposed that this increased sensitivity permeates cognitive abilities, and can be observed in an information-processing task assessing selective attention bias.

One way that researchers have been able to quantify such bias in the laboratory is with the Stroop task [13]. The Stroop task is a color-word interference task in which individuals are told to name the color and disregard the meaning of the word presented to them.

This involves competition in processing of different attributes of a stimulus presented within the focus of attention (i.e. color versus word content), and modified versions have been used in numerous studies to assess attention bias to emotional words [11]. The degree to which an individual is slower to name the color of negative emotional versus neutral words is though to indicate interference in information [11].

Investigating selective attention bias would be an important addition to our understanding of experiential avoidance because it would enhance our insight into possible underlying cognitive factors that might play a role in the development and maintenance of this coping strategy. In addition to increased processing of negative emotional stimuli [6] individuals high in EA may disproportionately attend to, or notice negative emotional stimuli. Alternately, individuals high in EA may have a bias to attend to highly arousing emotional stimuli, regardless of the valence (i.e., positive or negative).

Hypotheses

1. If EA disproportionately impacts the processing of negative stimuli, the high EA group will show increased reaction times to negative emotional versus positive emotional or neutral stimuli. Reaction times to negative emotional words will be greater in the high EA group versus the low EA group.
2. If EA is associated with attentional bias to highly arousing emotional stimuli, regardless of valence, then the high EA group will show increased reaction times to negative emotional versus neutral words. Furthermore, reaction times to positive emotional words will also be longer compared to neutral words. Reaction times on positive and negative emotional words will be greater than those observed in the low EA group.

Methods

Participants

From a larger pool of participants (N=81), individuals whose scores on the Acceptance and Action Questionnaire (AAQ-16; [4]) fell in the top or bottom quartiles formed two groups (i.e., high EA and low EA). The mean AAQ score for the low EA group (n = 20) was 43.85 (SD = 3.82), and the mean AAQ score for the high group (n = 22) was 67.77 (SD = 6.44). This quartile split is based on previous research on group differences in EA [6]. The mean age of participants was 19.66 (SD = 2.51) years. An equal number of participants (n = 21) were male and female. The majority of participants were Caucasian (96.8%), and average educational attainment was 13.73 (SD = .99) years. Informed consent was obtained and participants engaged in the study for course credit.

Procedures

Participants attended one laboratory session. During this session, participants filled out a self-report questionnaire measure of experiential avoidance. Participants also engaged in an Emotional Stroop Task to assess attention bias. Task order (questionnaires or Stroop Task) was counterbalanced.

Measures

1) Emotional Stroop Task

During this color-naming task, participants were presented with one word at a time on a computer screen, and instructed to identify the color of the word by pressing the appropriate key and disregard the word's meaning. Protocol for this study is similar to other studies using this task [14]. Three groups of words were used in this study: positive emotional, negative emotional, and neutral. Neutral words were included because previous research has shown them to be a useful control; given increased color naming latencies are specific to emotional stimuli. Words were presented in 12 blocks of 16 words each. Within each block, words were of the same category, with four blocks containing words of each type (positive, negative, or neutral). A block design was used based on previous research demonstrating that block designs tend to be better for eliciting emotional interference in healthy subjects [15]. The task was completed on a Dell Optiplex 260 with a PS, running Windows XP, at a distance of 1 meter from the participants' eyes. Words were presented on a 17-inch Dell flat screen monitor in capital letters using Arial 72-point font on a white background in red, green, or blue colored font. Participants first completed a practice round of 24 neutral words, to ensure understanding of the task. After the practice trial and each fourth block, there was a 1-minute resting period. Order of presentation (negative, neutral, positive) was counterbalanced.

Words were selected on the basis of established norms for arousal, frequency of usage in the English language, and valence [16], as well as number of letters. Positive and negative words had similar arousal levels across

each block. Average arousal for negative word blocks ranged between 5.45-5.91, with positive blocks ranging between 5.22-5.4, and neutral blocks ranging between 3.92-4.1. Positive and neutral words had higher frequency of usage. Negative blocks ranged from 25.0-26.81, positive blocks ranged between 64.43-67.9, and neutral blocks ranged from 67.38-69.93 in frequency of usage in the English language. Each word category (positive, negative, neutral) had different valence than the other categories, but each word block within each category had similar word valence. Negative word blocks ranged between 2.39-2.61, positive word blocks ranged between 7.43-7.64, and neutral word blocks ranged from 5.12-5.41 on average. Finally, all word blocks contained words ranging between 3-8 letters, and each block contained a similar number of letters on average across the block. Negative word blocks ranged between 6.19-6.43 words, positive word blocks ranged between 5.88-6.19 words, and neutral word blocks ranged between 5.94-6.13 words on average.

Selectively biased attention was measured by the amount of time it took for the individual to respond with the color of the word by pressing the appropriate color button on a DirectIN High Speed Button-Box. Incorrect responses were removed from analyses.

2) Acceptance and Action Questionnaire (AAQ-16).

The AAQ-16 [4] is a 16-item self-report measure specifically designed to measure experiential avoidance, or the tendency to avoid unwanted internal experiences. Each item is rated on a 7-point Likert scale ranging from 1 = "Never true" to 7 = "Always true." A total score is obtained by summing the responses with several items being reverse-scored (e.g., "I rarely worry about getting my anxieties, worries, and feelings under control"); higher scores indicate higher experiential avoidance. Research indicates adequate internal consistency (α = .70) on this measure [4]. With regard to validity of the AAQ, this measure converged with a wide range of psychopathology and maladaptive behaviors, as expected, including thought suppression, avoidant coping, decreased perceptions of wellbeing, anxiety, depression, anxiety sensitivity, and trauma reactions [4]. Low scores on the AAQ (i.e., low experiential avoidance) have been found to predict better mental health one year later compared to high scores [17]. Furthermore, higher scores on the AAQ were found to negatively correlate with perceptions of handicap level and life satisfaction in an inpatient medical rehabilitation sample assessed at three-month follow-up [18]. In the current study, the AAQ was used to determine group placement (i.e., high EA, low EA).

Results

The dependent variable for this study was mean reaction times on negative emotional, positive emotional, and neutral words in participants who were relatively high or low in experiential avoidance (EA) on an Emotional Stroop Task. Incorrect responses were removed from analyses, and one participant from the low EA group was removed due to an elevated number of incorrect responses (70% incorrect). All other participants had 96-100% correct responses. There were no significant differences for incorrect responses by group or word type. No outliers were found using criteria of $SD > 3$, below 200ms, or above 1,500 ms.

A mixed-model ANOVA was conducted and results revealed a significant main effect for word type (positive, negative, neutral) on the Emotional Stroop Task $F(2,39) = 4.035$, $p = .03$, partial $\eta^2 = .17$. There was not a significant interaction between word type and group (high EA, low EA), nor was there a significant main effect for group.

To examine our *a priori* hypothesis regarding within group differences between positive emotional, negative emotional, and neutral words, a series of paired samples t-tests were conducted within each group (see Figure 1). For the low EA group (n = 20), paired samples t-tests indicated a significant difference $t(19) = 2.32$, $p = .03$ between mean reaction times for negative (M = 538.7; SD = 122.7) and positive emotional words (M = 526.4; SD = 108.1), with individuals in the low EA group demonstrating longer reaction times for negative words compared to positive words. There was also a significant difference $t(19) = 2.148$, $p = .04$ between negative and neutral words (M = 524.6; SD = 122.1), with individuals in the low EA group demonstrating longer reaction times for negative words compared to neutral words. There was not a significant difference between neutral and positive words $t(19) = -.117$, $p = .91$.

For the high EA group (n = 22), paired samples t-tests did not reveal a significant difference between negative (M = 579.3; SD = 100.0) and positive (M = 580.3; SD = 87.8) emotional words $t(21) = -.124$, $p = .90$, nor between neutral and positive words $t(21) = -1.89$, $p = .07$. There was a significant difference $t(21) = 2.19$, $p = .04$ between negative and neutral words (M = 568.9; SD = 90.3), with

individuals in the high EA group demonstrating longer reaction times for negative words compared to neutral words. To examine our *a priori* hypotheses regarding between-group differences, independent samples t-tests were conducted. Results indicated a significant difference between high and low EA groups on positive emotional words $t(40) = -2.38$, $p = .02$, with individuals in the high EA group demonstrating longer reaction times on positive words compared to the low EA group. There were no significant differences between groups on neutral $t(40) = -1.76$, $p = .09$ or negative words $t(40) = -1.60$, $p = .12$.

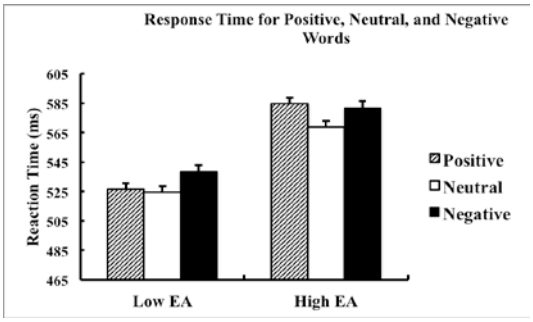

FIGURE 1 RESPONSE TIMES FOR LOW EA AND HIGH EA GROUPS ON POSITIVIE EMOTIONAL, NEGATIVE EMOTIONAL, AND NEUTRAL WORDS

Discussion

The results of this study indicate that individuals who are relatively high in EA display longer reaction times in response to highly arousing emotional words, regardless of the valence (i.e., positive or negative) of the stimuli. Within groups, individuals in the low EA group had longer reaction times for negative emotional words compared to positive emotional or neutral words, whereas individuals in the high EA group had longer response times to negative emotional words compared to neutral words. Between groups, individuals in the high EA group displayed longer reaction times to positive emotional words compared to individuals in the low EA group. Contrary to our first hypothesis, the two groups did not differ in response times for negative emotional words. There were no differences between the groups in response times for neutral words.

These results are an important contribution to our understanding of EA. First, little is known about increased sensitivity to distressing stimuli in the model of experiential avoidance, and even less is known about how this may function in terms of underlying cognitive factors. Results of this study indicate that individuals high in EA display a selective attention bias toward arousing emotional stimuli, suggesting that they are more sensitive to both positive and negative emotional cues. Second, this study expands on previous research on cognitive factors in EA. Previous studies indicate that individuals high in EA may have slower processing of negative versus positive emotional stimuli [6], and that high EA individuals may have impaired performance on cognitive tasks in the context of negative mood [7]. This study extends those findings indicating that EA may impact sensitivity to highly arousing emotional cues in general. Although previous research showed that high EA individuals display a bias in processing negative emotional information [6], the current study demonstrated that emotional stimuli, regardless of valence, interfered with the performance of the high EA group. Additionally, this study indicates that even without the induction of negative mood, individuals high in EA demonstrated slower response times on a cognitive task for emotionally arousing material. Future research should explore whether a negative mood induction leads to further differences in reaction times between high and low EA participants on positive and negative words.

This research indicates that individuals high in EA may perceive both negative and positive emotional stimuli as threatening or distressing. Greater response times for highly arousing stimuli may reflect attempts to avoid or suppress emotional material. This helps to further explain why EA is a particularly maladaptive coping strategy, in that it may impact both negative and positive emotional experiences, at least at the initial level of information processing. If individuals perceive both positive and negative emotional stimuli as aversive or as material to be avoided, this could limit their potential for experiencing or enjoying positive emotional experiences, which could further exacerbate distress. Future research should explore that relationship between EA and reactions to positive emotions.

There are several limitations in this study. First, considering that participants were relatively homogeneous in age and racial background, generalizability of the current results is limited. Research participants in this study were students at a rural northeastern university. Further research should explore the relationship between EA and underlying cognitive factors in other populations, including clinical samples. Second, the Stroop task has been criticized in previous research as potentially assessing interference from task-irrelevant information rather

than attention bias [11]. In this second scenario, the Stroop task could be said to assess interference of emotional words in this study. Additional research should be conducted using a variety of methods to clarify the meaning of these findings.

Overall, the results of this study aid in our understanding of how EA, as a functional response pattern, is involved in the processing of emotional material. This study adds to the model of EA by suggesting that individuals high in this construct have an increased sensitivity to emotionally arousing stimuli *in general*, not just to negatively-valenced stimuli.

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